REMARKS

This Amendment is filed in response to the Final Office Action mailed on April 3, 2006 and an interview with the Examiner on May 31, 2006. All objections and rejections are respectfully traversed.

Claims 1-36 and 38-46 are currently pending.

No new claims are added.

Claim Rejections – 35 USC §112

At page 1 of the Office Action, claim 46 was rejected under 35 U.S.C. §112, first paragraph as failing to comply with the written description requirement.

The Specification at page 13, lines 8-18 states:

"When a swarm is established, it is passed as a single group from the initiator process 332 to the WAFL process 308 upon replay. WAFL then processes these messages in a somewhat arbitrary order as part of the overall swarm. This differs from the prior art process in which messages are passed over in a particular sequence until the log is emptied. As discussed above, the WAFL process enters at least one of a LOAD, LOCK, MODIFY and RESIZE phase with respect to each message. It is recognized that, in most instances, the majority of messages will be able to occur without any preceding transaction message. Such messages can be carried out without regard to any preceding message. Accordingly, the replay of a swarm of 200 messages results, statistically, in a rapid succession of LOAD and MODIFY operations. However, certain messages do, in fact, require a preceding action to occur. In particular, a write to a file cannot occur before the file is created."

The paragraph above states that the WAFL processes these messages in an arbitrary order and is different from message passed in a particular sequence. The "arbitrary order" means the messages are not processed in a particular sequence because most messages are processed do not require a preceding transaction to happen. Therefore, the messages can be processed in any order or an arbitrary order. Accordingly, Applicant respectfully believes that claim 46 meets the written description requirement.

At pages 2-3 of the Office Action, claim 46 is rejected under 35 U.S.C. §112, second paragraph for being indefinite for failing to particularly point and distinctly claim the subject matter. The Examiner further states that the scope of "performing a parallel retrieval process for a plurality of messages in the swarm of messages by processing the messages in a somewhat arbitrary order."

Applicant has amended claim 46 and believes it meets the requirements of 35 USC §112.

Claim Rejections – 35 USC § 103

At page 3 of the Office Action, claims 1-4, 8-24, 26-40, and 46 were rejected under 35 U.S.C. §103 as being unpatentable over Fuchs et al., US Patent No. 5,440,726, hereinafter Fuchs, in view of Karp et al., US Patent No. 5,588,117, hereinafter Karp, and further view of Jadav et al., US Patent No. 6,128,762, hereinafter Jadav.

The present invention, as set forth in representative claim 1, comprises in part:

1. A system for replay of a backup memory in a storage system having a file system for managing transfer of data to and from an attached disk array, the system comprising:

     a log in the backup memory containing the storage system transaction entries accumulated after a consistency point at which time results of the storage system transaction entries are committed to the disk array;

     an initiator process that establishes a swarm of messages with respect to the storage system transaction entries and delivers the swarm to the file system; and

     a parallel disk information-retrieval process in the file system that is carried out on the swarm of messages in parallel by one or more processors within the storage system.

By way of background, Fuchs describes a computing system that concurrently executes a plurality of different application processes. *See* col. 5, line 66 through col. 6, line 4. The processes communicate with one another by passing messages. *See* col. 2, lines 38-42. Each application process is associated with a corresponding nonvolatile (backup) memory 44 containing logs of the process's incoming and outgoing messages. *See* col. 6, lines 12-15 and fig. 1. The nonvolatile memory also stores the process's "critical" program data, which is transferred to the memory at regular "checkpoint" time intervals. *See* col. 3, lines 2-5. Furthermore, Fuchs system is an in seriatim system because it replays messages in series, one after the other. (Col. 18, lines 36-44) The in seriatim technique was recognized by the Applicant's as a prior art technique and described by the applicant in the Background of the invention on page 4, lines 3-10 on the application as filed.

Karp describes a communication protocol for group ordered message processing. A sending application groups messages together. The messages within the group are then processed in the order they are received. Additionally, the groups of messages are processed in the order sent.

Jadav describes a parallel system for different computers to access a common data storage system. In the system, data is stored by the different computers over a plurality of storage devices. The system uses logical locking to lock blocks while a write is being processed by one of the computers.

Applicant respectfully urges that Fuchs, Karp, and Jadav, taken alone or in combination do not teach or disclose Applicant's claimed novel *a parallel disk information-retrieval process in the file system that is carried out on the swarm of messages in parallel by one or more processors within the storage system*. In further detail, Applicant's invention uses either a single processor in the storage system to process the message in parallel by commingling steps of separate messages of the swarm of messages or uses more than one processor in the storage system to process the plurality of messages in the swarm, or a combination with more than one processor commingling the steps of separate messages of the swarm of messages. In contrast, Jadav discloses multiple stand alone computers each connected to a each storage device of a group of storage devices. There is no disclosure in Jadav to process the swarm of messages *in parallel by one or processors within the storage system* because Jadav describes stand alone computers running their own operating system. In contrast, Applicant's invention uses a storage system for

16

processing the plurality (swarm) of messages in parallel through multiple processors or a single processor within the storage system. Furthermore, Fuchs discloses replaying the message in the order they are received. Additionally, Karp describes processing the messages in the order they are received.

Accordingly, Applicant respectfully urges that Fuchs, Karp, and Jadav, taken either singly or in combination, are legally precluded from rendering Applicant's claimed novel invention unpatentable under 35 U.S.C. 103 (a) because of the absence from the cited art of Applicant's claimed novel *a parallel disk information-retrieval process in the file system that is carried out on the swarm of in parallel by one or more processors within the storage system.*

At page 11 of the Office Action, claims 5 and 25 were rejected under 35 U.S.C. §103 as being unpatentable over Fuchs, Karp, and Jadav, and in further view of Park et al., US Patent Application Publication 2003/0131190, hereinafter Park.

At page 12 of the Office Action, claims 6 and 7 were rejected under 35 U.S.C. §103 as being unpatentable over Fuchs, Karp, and Jadav, and in further view of Crighton, US Patent No. 6,330,570, hereinafter Crighton.

Applicant respectfully notes that claims 5-7 and 25 are dependent claims that depend from independent claims believed to be in condition for allowance. Accordingly, claims 5-7 and 25 are believed to be in condition for allowance.

Claim Rejections – 35 USC § 102

At page 14 of the Office Action, claims 41-45 were rejected under 35 U.S.C. §102

as being anticipated by Fuchs.

The present invention, as set forth in representative claim 41, comprises in part:

41. A file system, comprising:

a backup memory storing a plurality of file system transaction entries;

a first process that establishes a swarm of messages with respect to the file system transaction entries and delivers the swarm of messages to the file system;

a second process that performs a parallel LOAD phase for a plurality of messages in the swarm of messages where the LOAD phase is processed by commingling one or more steps of the LOAD phase applied to each message of the swarm of messages; and

a third process that performs a MODIFY phase for at least some messages in the swarm of messages, the MODIFY phase operating on messages based on the order in which file system transaction entries were stored in the backup memory.

Applicant respectfully notes that the rejection is believed to be a §103 rejection as

it is based on the combination of Fuchs and Karp.

Applicant respectfully urges that Fuchs and Karp taken alone or in combination

do not disclose Applicant's novel *a second process that performs a parallel LOAD*

phase for a plurality of messages in the swarm of messages where the LOAD phase is

processed by commingling one or more steps of the LOAD phase applied to each mes-

sage of the swarm of messages. In further detail, Applicant is not processing the transac-

tion in the order they were stored in backup memory. Applicant's invention processes all the steps of a LOAD phase by commingling the steps performed on each message of the swarm of messages. In contrast, Fuchs describes processing the messages in the order they are received, and is silent in regard to commingling the steps of the LOAD phase. Fuchs only describes separate nodes (computers) that perform separate processing of the message in series. There is no disclosure in either Fuchs or Karp of *commingling one or more steps of the LOAD phase applied to each message of the swarm of messages*.

Accordingly, Applicant respectfully urges that both Fuchs, and Karp, taken either singly or in combination, are legally precluded from rendering Applicant's claimed novel invention unpatentable under 35 U.S.C. 103 (a) because of the absence from both patents of Applicant's claimed novel *a second process that performs a parallel LOAD phase for a plurality of messages in the swarm of messages where the LOAD phase is processed by commingling one or more steps of the LOAD phase applied to each message of the swarm of messages*

In the event that the Examiner deems personal contact desirable in the disposition of this case, the Examiner is encouraged to call the undersigned attorney at (617) 951-3067.

All independent claims are believed to be in condition for allowance.

All dependent claims are dependent from independent claims which are believed to be in condition for allowance. Accordingly, all dependent claims are believed to be in condition for allowance.

Favorable action is respectfully solicited.

19

Please charge any additional fee occasioned by this paper to our Deposit Account

No. 03-1237.

Respectfully submitted,

Shannen C. Delaney
Reg. No. 51,605
CESARI AND MCKENNA, LLP
88 Black Falcon Avenue
Boston, MA 02210-2414
(617) 951-2500